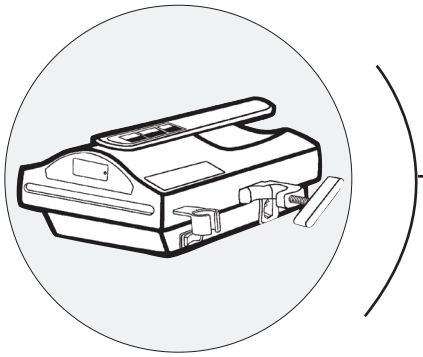


Ranger® Blut-/Flüssigkeitswärmeeinheit
Betriebshandbuch

Réchauffement de sang/soluté Ranger
Manuel de l'utilisateur

Sistema per il riscaldamento di sangue e di fluidi Ranger
Manuale d'uso

Calentamiento de fluidos /plasma
Manual del usuario

Sistema de aquecimento de sangue/fluidos Ranger
Manual do utilizador

Ranger bloed/vloeistofverwarming
Gebruiksaanwijzing

Ranger Blod-/Væskeopvarmning
Brugsanvisning

Ranger blod-/vätskeuppvärmning
Användarhandbok

Ranger-blod/væskevarming
Bruksanvisning

Ranger veren/nesteen lämmitin
Käyttäjän opas

Θέρμανση αίματος/υγρών Ranger
Εγχειρίδιο Χειριστή

Ranger血液/輸液加温
取扱説明書

Urządzenie do ogrzewania krwi/płynów Ranger
Instrukcja Obsługi

Ranger vér-/folyadékmelegítő
Használati Utasítás

Ohřívání krve a kapalin - Ranger
Návod k obsluze

„Ranger" kraujo/skysčio šildymas
Vartotojo vadovas

Ranger Подогрев крови/жидкости
Руководство оператора

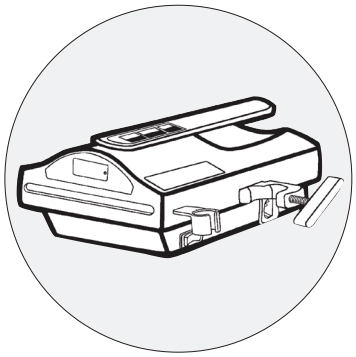
Ranger血液（液体）升温
操作员手册

Operator's Manual

Ranger
Blood/Fluid Warming

Ranger* Blood/Fluid Warming

Arizant Healthcare
bright ideas that work



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Technical Service and Order Placement

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UNITED KINDGOM
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FAX: +44-1924-200518

GERMANY
TEL: +49-4154-9934-0
FAX: +49-4154-9934-20

FRANCE
TEL: +33-4-42-98-14-00
Indigo (in France only): 0-820-33-90-40
FAX: +33-4-42-98-14-01

In-warranty repair and exchange

Replacement parts to correct a problem are delivered at no charge. To return a device to Arizant Healthcare Inc. for service, first obtain a Return Authorization (RA) number from a customer service representative. Please use the (RA) number on all correspondence when returning a device for service. A shipping carton will be delivered to you at no charge, if needed. We will service and ship your device within five (5) working days of our receipt. Call your local supplier or sales representative to inquire about loaner devices while your device is being serviced.

When you call for technical support

Remember, we will need to know the serial number of your unit when you call us. The serial number label is located on the bottom of the warming unit.

Introduction

The Ranger blood/fluid warming system includes a warming unit and a disposable IV blood/fluid administration set. The Ranger warming system is designed to warm blood, blood products, and liquids and deliver these at flow rates from KVO to 500 ml/min. At these flow rates, the device maintains fluid output temperatures ranging from 33°C to 41°C (Note: Output temperatures are dependant on input fluid temperatures and flow rate). It takes less than 2 minutes to warm up to the 41°C set point temperature.

Two disposable blood/fluid sets are available: one for standard flow applications and one for high flow applications. Disposable sets are sterile, latex-free, single-use-only items and are designed to be used with the reusable warming unit.

The Ranger warming unit is designed to be mounted to an IV pole. A handle located on the top of the unit makes transport easy. When mounted to the IV pole, the unit fits easily above the Bair Hugger warming unit.

Indications for use

The Ranger warming system is intended to warm blood, blood products, and liquids.

Warnings and Cautions

WARNING

- Electrical shock hazard. Do not open the warming unit case.
- Do not substitute other devices (i.e. model 247) for the Ranger blood/fluid warming unit or Ranger blood/fluid disposable sets. Thermal or electrical injury or device damage may occur.
- Do not continue use of the unit if the over-temperature alarm continues to sound and the temperature does not return to the set point temperature. Immediately stop fluid flow and discard the disposable set. Have the warming unit tested by a biomedical technician or call Arizant Healthcare Inc. technical service.
- Never infuse fluids if air bubbles are present in the fluid line, as air embolism may result.
- Equipment not suitable for use in the presence of a flammable anaesthetic mixture with air or with oxygen or nitrous oxide.

CAUTION

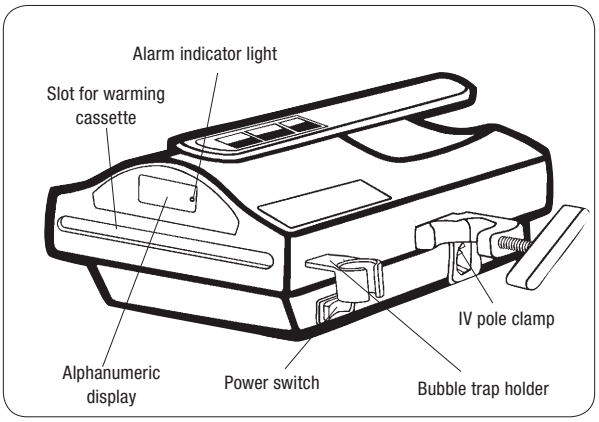
- Do not immerse the warming unit. Wipe with a clean, slightly damp cloth.
- To prevent tipping, clamp the Ranger blood/fluid warming unit to an I.V. pole with a minimum 14" (35.6 cm) radius wheelbase and at a height no higher than 44" (112 cm). Failure to do so may result in damage to the product.

Product Description

The Ranger blood/fluid warming system consists of a warming unit and a sterile disposable IV blood/fluid delivery set.

The Ranger warming unit

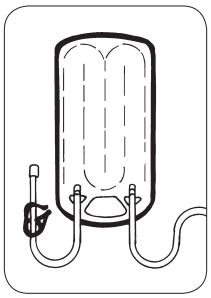
The warming unit is a compact, lightweight, liquid-resistant device with a clamp located on the side for attachment to an IV pole. A carrying handle on the top of the unit makes it easy to transport. Located on the front panel you will find:



- Alphanumeric display that indicates the heater temperature during normal operation. In an over-temperature condition, the display alternately flashes a temperature of 43°C or higher and the word “HI.” In an under-temperature condition, the display alternately flashes a temperature of 33°C or lower and word the “LO.”
- Alarm indicator light that comes on when either an over- or under-temperature condition occurs.

Ranger disposable set

Blood/fluid administration sets include a warming cassette (heat exchanger), tubing and connectors compatible with hospital standard IV blood/fluid administration sets, bubble trap, and injection port. The High Flow set also includes 2 blood/fluid bag spikes and a 150 micron filter located in a central drip chamber.



Warming Cassette

	Flow Rate	Priming Volume	Patient Line Length
Standard Flow Set	150 ml/mn	39-44 ml	76 cm 152 cm (76 cm patient line plus 76 cm extension)
High Flow Set	100-500 ml/min	150 ml	152 cm (76 cm patient line plus 76 cm extension)
Pediatric/Neonate	6 L/hr	20 ml	46 cm

Disposable irrigation sets deliver 30 L/hr flow rates and 142 ml priming volume. They include spike sets and a 183 cm patient line.

Refer to the instructions provided with each disposable set for information on use.

Product safety features

The following chart describes the safety alarm features of the Ranger warming unit.

ALARM TYPE	WHAT TO LOOK FOR	DESCRIPTION/CAUSE	ACTION
Over-temperature alarm - 43°C	Alarm indicator light illuminates and alarm sounds, alphanumeric display alternately flashes a temperature of 43°C or higher and the word “HI.”	Heater temperature rose to 43°C because of transient conditions.*	Observe alphanumeric display. If temperature does not drop to 41°C (may take a few minutes), discontinue use of unit. Call Arizant Healthcare Customer Service.
Under-temperature alarm - 33°C	Alarm indicator light illuminates and alarm sounds, alphanumeric display alternately flashes a temperature of 33°C or lower and the word “LO.”	Heater temperature has fallen to 33°C.	Alarms stop when temperature rises above 33°C. Continue use of unit. If the temperature does not rise above 33°C, unplug the unit and call Arizant Healthcare Customer Service.

Warming units Rev A to M

Independent back-up safety alarm - 46°C	• Alarm indicator light illuminates and alarm sounds, alphanumeric display alternately flashes a temperature of 43°C or higher and the word “HI.” • Alphanumeric display is dark, alarm sounds (backup safety alarm still works even if display is dark).	Heater temperature rose to 46°C. Safety backup system is activated at 46°C and unit shuts off power to the heating plates.	TURN OFF THE UNIT AND UNPLUG IT. Do not use the unit. Discard the disposable set. Call Arizant Healthcare Customer Service.

Warming units Rev N and newer

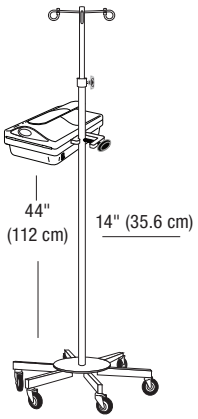
Independent back-up safety alarm - 44°C	• Alarm indicator light illuminates and alarm sounds, alphanumeric display alternately flashes a temperature of 43°C or higher and the word “HI.” • Alphanumeric display is dark, alarm sounds (backup safety alarm still works even if display is dark).	Heater temperature rose to 44°C. Safety backup system is activated at 44°C and unit shuts off power to the heating plates.	TURN OFF THE UNIT AND UNPLUG IT. Do not use the unit. Discard the disposable set. Call Arizant Healthcare Customer Service.

*Transient conditions may cause an over-temperature alarm condition. These conditions include:

- There was an extreme change in flow rates (e.g., from 500 mL/min to stop flow).
- The unit was turned on and reached the set point temperature of 41°C before the warming cassette was inserted in the device.
- Fluids were prewarmed to above 42°C before being infused.

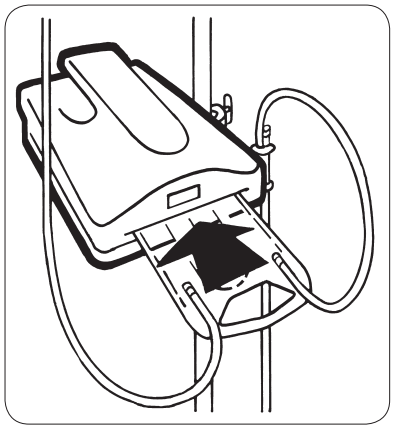
Instructions for Use

Preparation and setup of the Ranger warming unit



1. Attach the Ranger warming unit to the IV pole. Tighten the pole clamp securely.

Caution: To prevent tipping, clamp the Ranger warming unit to an IV pole with a minimum 14" (35.6 cm) radius wheelbase and at a height no higher than 44" (112 cm). Failure to do so may result in damage to the product or catheter site trauma.



2. Slide the fluid warming cassette into the slot in the warming unit. The cassette can only fit into the device one way.
3. Prime the disposable set. For more information about priming the set, refer to instructions provided with the disposable sets.
4. Place the bubble trap in the holder.
5. Plug the power cord into an appropriate outlet. Turn the unit ON. In a few seconds the alphanumeric display will illuminate. It takes less than 2 minutes to warm up to the 41°C set point temperature.
6. Begin infusion. When infusion is completed, remove the disposable set and discard according to institutional protocol.

Removing the disposable set from the Ranger warming unit

1. Close the inlet clamp proximal to the fluid warming cassette and open all clamps distal to the cassette.
2. Disconnect the disposable set from the fluid source, if applicable.
3. Allow fluid to flow to the patient (this may take 2-3 seconds). Close a distal clamp.
4. Remove the fluid warming cassette from the warming unit and discard according to institutional protocol.
5. Reconnect the patient IV line to the fluid source to continue the infusion without warming.

Transferring the disposable set from one Ranger warming unit to another

1. Follow steps 1-3 above, then remove the disposable set from the first warming unit.
2. During transport, keep the clamps closed and do not infuse fluids while the warming cassette is outside of the warming unit.
3. Slide the warming cassette into the second warming unit.
4. Ensure that air is removed from the tubing.
5. Open the clamps and continue the infusion.

Troubleshooting

Condition	Cause	Solution
Nothing illuminates on the warming unit panel.	• Unit is not turned on, plugged in, or power cord is not plugged into an appropriate outlet. • Unit failure.	• Turn unit on. Make sure the power cord is plugged into the power entry module of the warming unit. Make sure the warming unit is plugged into a properly grounded outlet. • Call Arizant Healthcare Customer Service.

Condition	Cause	Solution
Alarm indicator illuminates and alarm sounds, alpha-numeric display alternately flashes a temperature of 43°C or higher and the word "HI."	Temporary over-temperature condition because: • An extreme change in flow rates occurred (e.g., from 500 ml/min to stop flow). • Unit was turned on and reached set point temperature before warming cassette was inserted. • Fluids were prewarmed to above 42°C before being run through the warming unit.	• Open flow to reduce temperature. Alarms will stop when the display reads 41°C. The unit is ready to use. • Alarms will stop when the display reads 41°C. The unit is ready to use. • Turn off unit. Discontinue infusion of fluids. Do not warm fluids before infusing them through the Ranger unit.

Condition	Cause	Solution
Alarm sounds, alphanumeric display and alarm indicator light go dark.	Primary controller failure. Unit will no longer operate.	Power to heating plates will shut off if temperature rises to 44°C (warming unit Rev N and newer) or 46°C (warming units Rev A to M). Turn unit off and unplug it. Discontinue use of unit. Discard disposable set. Alarm will continue to sound if you do not unplug unit. Call Arizant Healthcare Customer Service.

Condition	Cause	Solution
• Unit alarms soon after plugging it in (unit does not have to be turned on for this condition to occur). • Heater temperature rises to 44°C (warming units Rev N and newer) or 46°C (warming units Rev A to M) and unit shuts down soon after plugging it in (unit does not have to be turned on for this condition to occur).	Test screw on bottom of unit is loose or missing.	Make sure test screw is completely tightened. If it is missing, turn unit off and unplug it. Call Arizant Healthcare Customer Service.

Condition	Cause	Solution
Alarm sounds but unit has been turned off.	Independent backup safety system has been activated.	Unplug unit. Call Arizant Healthcare Customer Service.

Condition	Cause	Solution
Cannot remove warming cassette from unit.	• Warming cassette is too full, fluids are still being infused, or clamp is open proximal to the warming cassette.	• Make sure fluid is drained from warming cassette before sliding out the cassette, that fluids are no longer infusing, and that clamp is closed proximal to the warming cassette.
	• Warming unit is below patient level, creating excessive back pressure	• Raise unit above patient level.

Condition	Cause	Solution
Alarm indicator light illuminates and alarm sounds, alphanumeric display alternately flashes a temperature of 33°C or below and the word “LO.”	Under temperature condition caused by very high flow using very cold fluid, or defective heater/relay.	Alarm should stop when temperature rises above 33°C. If alarm continues, unplug unit and discontinue use. Call Arizant Healthcare Customer Service.

Condition	Cause	Solution
Alphanumeric display reads “Er 4” or “Open.”	Open wire on temperature sensor.	Do not use unit. Call Arizant Healthcare Customer Service.

Condition	Cause	Solution
Alphanumeric display reads “Er 5” or “Open.”	Electrical interference.	Remove the unit. Refer to biomedical technician or call Arizant Healthcare Customer Service.

Maintenance and Storage

Cleaning the Ranger blood/fluid warming unit

Clean the Ranger unit on an as-needed basis

CAUTION

- Do not immerse the warming unit in cleaning or sterilizing solutions. The unit is not liquid proof.
- Do not clean the warming unit with solvents. Damage to the case, label, and internal components may result.

TO CLEAN THE EXTERIOR OF THE WARMING UNIT:

1. Disconnect the Ranger warming unit from the power source.
2. Wipe the outside of the unit with warm, soapy water, nonabrasive cleaning solutions, dilute bleach, or cold sterilants. Do not use abrasive materials.
3. Wipe with a dry, soft cloth.

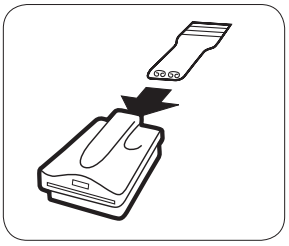
TO CLEAN THE HEATING PLATES:

The Ranger blood/fluid hardware cleaning tool is intended to clean both heating plates of the warming unit. It is not necessary to disassemble the warming unit to use the tool.

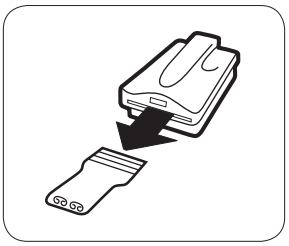
CAUTION

- Do not insert metallic instruments in the warming unit, as damage to the heating plates may occur.
- Do not use abrasive materials or solutions to clean the heater plates.
- Do not allow spills to dry inside the unit, as this may make it more difficult to clean the unit.
- The cleaning tool provides only superficial cleaning, it does not disinfect or sterilize the interior of the unit.

Method



1. Unplug the warming unit.
2. Unfold the cleaning tool. Wet the foam pads with a nonabrasive solution, such as Alconox* brand detergent.
3. Insert the tool from the back of the unit and pull the tool all the way out from the front.
4. Rinse the tool with water and repeat 3 times.
5. Wipe off the unit to remove excess fluid.



TO CLEAN RESISTANT, DRIED-ON FLUIDS:

1. Spray a nonabrasive solution inside the slot of the warming unit and let sit for 15-20 minutes.
2. Clean the unit by using the cleaning tool.

Note: If the cleaning tool cannot be inserted through the slot of the warming unit because of excess dried-on fluids, send the unit to a biomedical technician.

Storage

Store all components in a cool, dry place when not in use.

Servicing

There are no user-serviceable parts in the Ranger warming unit. All service must be performed by Arizant Healthcare Inc. or an authorized service technician. Call Arizant Healthcare Inc. Technical Service at 800-733-7775 or 952-947-1200 for service information.

*Alconox is a registered trademark of Alconox, Inc.

Specifications

Physical characteristics

WARMING UNIT

4.5 in. (11 cm) high x 7.5 in. (19 cm) wide x 10 in. (25 cm) long; wt.: 7 lb. 7 oz. (3.4 kg)

CLASSIFICATION

Classified under IEC 601-1 Guidelines (and other national versions of the Guidelines) as Class I, Type B, Ordinary Equipment. Not suitable for use in the presence of flammable anesthetic mixtures with air or with oxygen or nitrous oxide. Classified by Underwriters Laboratories Inc. with respect to electric shock, fire, and mechanical hazards only, in accordance with UL 2601-1 and in accordance with Canadian/CSA C22.2 No. 601.1.

Electrical characteristics

DEVICE RATING

100-120 VAC, 50/60 Hz
220-240 VAC, 50/60 Hz

MAXIMUM HEATING POWER

900 W

FUSE

10 Amp

Temperature characteristics

SET POINT TEMPERATURE

41°C

OVER-TEMPERATURE ALARM

43°C

UNDER-TEMPERATURE ALARM

33°C

OVER-TEMPERATURE CUTOFF

44°C (warming units Rev N and newer)
46°C (warming units Rev A to M)

Leakage current

Meets leakage current requirements in accordance with UL 60601-1 and IEC 601-1.

Environmental conditions

OPERATING TEMPERATURE RANGE

15° to 40°C (59° to 104°F)

STORAGE TEMPERATURE RANGE

-20° to 45°C (-4° to 113°F)

OPERATING HUMIDITY

10 to 85% RH, noncondensing

ATMOSPHERIC PRESSURE RANGE

50 kPa to 106 kPa

Definition of Symbols

ON

OFF

Fuse

Attention - Read accompanying documents

Type B Applied Part

Voltage, Alternating Current (AC)

Equipotentiality plug (ground)

Special Refuse, discard separately

Protective earth ground